

[11] Patent/Publication Number: EP0122902B1

[45] Publication Date: Aug. 08, 1990

[54] DRIVE-THROUGH CHAMBER TYPE TIMBER DRYING KILN

[72] Inventor(s):

Uimonen; Matti , , Monontie 13 , SF-15950 Lahti FI

[73] Assignee/Applicant:

TEKMA OY , SF-15100 Lahti FI

[30] Priority:

FI Apr. 19, 1983 831331

[21] Application Number: EP84850119 EP

[22] Application Date: Apr. 12, 1984

[51] Int. Cl.⁵: F26B01516 ; F26B00906; F26B00304

[56] References Cited:

U.S. PATENT DOCUMENTS

335918 /PCIT AT [0]

FOREIGN PATENT DOCUMENTS

1150854 /PCIT GB [0]

1729259 /REFS DE [0]

Attorney, Agent, or Firm - Onn, Thorsten et al

[57] ABSTRACT

A drive-through chamber drier for timber where the timber loads (P) to be dried are carried on a roller track (10) through a front door (11) into the drying chamber. From the drying kiln, the timber loads (P) are removed after drying from the opposite side of the drying kiln through a rear door (13). The drying kiln comprises two or more drying chambers (K¹, K³; K², K⁴) connected in series. Of these chambers (K¹, K³; K², K⁴) connected in series, each chamber operates independently in such way that when the timber loads are moved from a first chamber (K¹, K³) to the second chamber (K², K⁴) the drying will be carried on in this chamber (K², K⁴) starting substantially at the point which had been reached in the dry-ing process in the first chamber (K¹, K³).

DETAILS

1 EP

Description

The present invention concerns a drive-through chamber type timber drying kiln, where timber loads to be dried are conveyed on a roller track or 5 equivalent through a front door into the drying kiln, and from which drying kiln, subsequent to drying, the timber loads are removed on the opposite side of the drying kiln through a rear door, and in which drying kiln two or more drying 10 chambers are connected in series each chamber being provided with its own means for treatment of drying air to operate independently so that individual drying conditions can be realized in each chamber independently of the other cham- 15 bers.

So-called drive-through chamber type drying kilns are known in prior art. Their structure is such that drying kiln loads assembled of drying film packages are carried into the drying chamber on a 20 roller track in front of them, whence the loads are pushed into the drying chamber. The dried loads are taken out through the opposite door of the drying chamber. It is an advantage of these chamber-type drying kilns known in the art that in 25 them the load changing time is comparatively short. However, a disadvantage is the expensive realization of such drying kilns, because they require two opposite doors, and roller tracks on both sides of the drying chamber. 30 From AT--A--335 918 is known a continuous-operation drying channel comprising two loading zones. However, those zones are only separated from each other by means of an interspace. It is intended that the air should be circulating 35 separately in the different zones, but to a large extent the circulating air in one zone becomes mixed with the circulating air in the adjacent zone. Therefore the temperature and moisture in differ- ent zones can only deviate to a very small extent 40 from each other.

The object of the present invention is to provide a simple design by which the drawbacks mentioned can be substantially reduced, and to pro- vide a chamber-type drying kiln in which the 45 advantageous characteristics of the chamber-type drying kiln, mentioned above, are preserved.

For attaining these aims and those to be dis- closed below, the invention is characterized in that each chamber is closed and separated from 50 an adjacent chamber by means of a light- weight partition, and that the drying conditions being adjusted such that when the timber loads are being transferred from a first chamber to the next chamber, in this next chamber the drying process 55 is carried on substantially from that point of the drying schedule which had been reached in the drying process in the previous chamber. In the following, the invention is described in detail reference being made to an embodiment example 60 of the invention presented in the figures of the drawing attached, to the details of which the invention is not confined.

Fig. 1 presents in elevational view a chamber- type drying kiln of the invention. Fig. 1 is at the 65 3.

Fig. 3 shows the horizontal section III-III in Fig. 2.

As shown in the figures, the chamber-type drying kiln comprises four drying chambers K1, K2, K3 and K4. The chambers K1 and K2 among themselves and the chambers K3 and K4 among themselves are connected in series. Thus, the chambers K1 and K2 in combination and the chambers K3 and K4 in combination constitute two chamber groups, both of them having only one front door 11 and one back door 13. Through the chamber groups K1, K2 and K3, K4 pass the roller tracks 10. The initial parts 10a at these roller tracks are located outside the doors 11, and similarly the ultimate ends 10b of the roller tracks 10 are located outside the rear doors 13. The timber loads P1 to be dried are brought to the initial ends 10a of the roller tracks, and the finished dried loads P3 are tkane off the ultimate ends 10b of the

roller tracks 10.

The chamber-type drying kiln comprising two drying kiln groups is composed of outer walls 14 and partitions 16, of a roof 15, and of the front doors 11 and rear doors 13 mentioned. Between the first chambers K1 and K3 and the second chambers K2 and K4 are provided light-weight partitions 12, for instance made of flexible fabric-type material, because these partitions 12 need not be thermally lagging. The partitions 12 are advantageously of such kind that it is possible to push the drying kiln loads P2 through them from the first chamber K1, K3 to the second chamber K2, K4.

Each drying chamber K1-K4 is provided with means by which circulation Fk of drying air through the timber loads P2 and P3 composed of packages provided with spacers is achieved. Said means comprise one or more blowers 20 and a heating radiator 21 placed in a duct 22. On the intake side of the blowers 20 in the duct 22 is introduced through ventilation ducts 26 an inlet air flow Fin from outdoors, and similarly, on the pressure side of the blowers 20, an outlet air flow Fm,t is taken off through ventilation ducts 25. In connection with the ventilation ducts 25 and 26 are provided control dampers 23 and 24, by the aid of which, combined with regulation of the radiators 21, the drying capacity of the circulating air Fk is influencable. Said means are separated from the load space by a partition 17, which is open on both sides (apertures 18 and 19). Through one aperture 19 the circulating air can pass to one side of the load, and through the other aperture 18 it is enabled to return to the blowers, having in the meantime passed through the loads. The direction in which the air circulates is reversed at regular intervals, usually automatically.

The drive-through chamber type drying kiln described in the foregoing operates as follows. The first chambers K1 and K3 and the second 0 122 902 B1 2 same time the vertical section along the line I-I indicated in Fig. 3.

Fig. 2 shows the vertical cross section II-II in Fig.

CLAIMS (ENGLISH)

Claims

EP 0 122 902 B1 4 claims 1 to 3, characterized in that the partition (12) is made of flexible fabric-like material.

CLAIMS (GERMAN)

Patentansprüche

1. Durchlauf-Kammertrockenofen, in dem die zu trocknenden Holzladungen (P) auf einer Rollenbahn (10) oder dergleichen durch eine vordere Tür (11) in die Trockenkammer gefördert werden, aus der die Holzladungen (P) nach dem Trocknen auf der entgegengesetzten Seite durch eine hintere Tür (13) entfernt werden, und in dem zwei oder mehr Trockenkammern (K., K2, K3, K4) in Reihe miteinander verbunden sind, wobei jede dieser Trockenkammern ihre eigenen unabhängig arbeitenden Mittel zur Behandlung der Trocknungsluft besitzt, so daß in jeder Trockenkammer unabhängig von den anderen Trockenkammern individuelle Trocknungsbedingungen herstellbar sind, dadurch gekennzeichnet, daß

jede Trockenkammer geschlossen und von einer benachbarten Trockenkammer durch eine Leichtbau-Zwischenwand getrennt ist, und daß die Trocknungsbedingungen so eingestellt sind, daß dann, 25 wenn die Holzladung von einer ersten Trocken- kammer (K1, K3) zu der nächsten Trockenkammer (K2, K4) verbracht wird, der Trocknungsprozeß in dieser nächsten Trockenkammer (K2, K4) im wesentlichen von demjenigen Punkt des Trock- nungsplans aus durchgeführt wird, der in dem Trocknungsprozeß in der vorhergehenden Trok- kenkammer (K,, K3) erreicht wurde.

2. Kammertrockenofen nach Anspruch 1, dadurch gekennzeichnet, daß wenigstens zwei Trockenkammern (K,, K3 und K2, K4) in Reihe angeordnet sind und daß auf diese Weise gebildete Gruppen von Trockenkammern einzeln oder zu mehreren parallel angeordnet sind.

3. Kammertrockenofen nach Anspruch 1 oder 2, bei dem auf einer Seite der Trockenkammer eine Luftzirkulationsleitung (22) mit Gebläsemitteln (20), ein Heizungsradiator (21) sowie Lufteinlaßund -auslaßmittel (23, 24, 25, 26) vorgesehen sind, dadurch gekennzeichnet, daß in den in Reihe verbundenen Trockenkammern (K,, K3; K2, K4) die Luftzirkulationströme (Fk) se angeordnet sind, daß ihre Richtungen entgegengesetzt sind.

4. Kammertrockenofen nach einem der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß die 50 Zwischenwand (12) aus flexiblen gewebeartigen Material hergestellt ist.

1. Four de séchage du type à chambres transitoires dans lequel des charges de bois (P) à sécher sont acheminées sur une ligne à rouleaux (10) ou un système équivalent, franchissent une porte avant (11) et pénètrent dans le four de séchage, après le séchage les charges de bois (P) étant évacuées sur le côté opposé du four de séchage à travers une porte arrière (13), four de séchage dans lequel deux ou plus de deux chambres de séchage (K,, K2, K3 K4) sont reliées en série, chaque chambre étant munie de son propre chambers K3 and K4 of the chamber groups operate independently. When Toads P2 are transferred from the first chambers K,, K3 into the second chambers K2, K4, drying is carried on subsequent to this transfer as if no transfer had 5 taken place, in other words, after the transfer, one begins to follow the drying schedule in the second chambers K2, K4 starting at that point in the drying process which has been reached in the drying in the first chambers K1, K3. It is advan- ro tageous, to this end, if the circulating air flow Fk in the first chambers K1, K3 and in the second chambers K2, K4 have opposite direction.

As has been set forth, each group of chambers contains two drying chambers K,, K2, K3, K4. In 15 certain applications there may be even more such chambers in series, for instance three or four.

It is thus understood that in accordance with the invention a drive-through chamber type drying kiln has been obtained in which for each chamber 20 group K,, K2 and K3, K4 there are still only two doors 11 and 13 and only one roller track 10 or equivalent track system passing through the chambers.

1.'A drive-through chamber type drying kiln, where timber Toads (P) to be dried are conveyed on a roller track (10) or equivalent through a front door (11) into the drying chamber, and from which drying kiln the timber loads (P) subsequent to drying are removed on the opposite side of the drying kiln through a rear door (13), and in which drying kiln two or more drying chambers (K,, K2, K3, K4) are connected in series, each chamber being provided with its own means for treatment of drying air to operate independently so that individual drying conditions can be realized in each chamber independently of the other chambers, characterized in that each chamber is closed and separated from an adjacent chamber by means of a light-weight partition (12), and that the drying conditions being adjusted such that when the timber loads are being transferred from a first chamber (K,, K3) to the next chamber (K2, K4), in this next chamber (K2, K4) the drying process is carried on substantially from that

point of the drying schedule which had been reached in the drying process in the previous chamber (KI, K3).

2. Chamber drying kiln according to claim 1, characterized in that drying chambers (KI, K3) and (K2, K4) have been provided at least two in series Revendications and that chamber groups thus produced are disposed one or several in parallel with each other.

3. Chamber drying kiln according to claim 1 or 2, having on one side of the drying chamber an air circulation duct (22) with blower means (20), a heating radiator (21) and intake air and exhaust means (22, 24, 25, 26), characterized in that in the chambers (K" K3, K2, K4) connected in series the circulating air flows (Fk) have been arranged to be opposite in direction.

4. Chamber drying kiln according to any one of EP 0 122 902 BI 6 nombre d'au moins deux en série, et en ce que les groupes de chambres ainsi constitués sont dis-posés parallèlement l'un ou plusieurs par rapport à l'utre.

3. Four de séchage à chambres transitoires selon la revendication 1 ou 2, comportant sur un côté de la chambre de séchage une canalisation de circulation d'air (22) avec une soufflante (20), un radiateur de chauffage (21) et des moyens o d'admission et d'évacuation d'air (23, 24, 25, 26), caractérisé en ce que dans les chambres (K,, K3, K2, K4) reliées en série, les courants d'air de circulation (FK) ont été agencés de façon à être de sens opposés.

4. Four de séchage à chambres transitoires selon l'une quelconque des revendications 1 à 3, caractérisé en ce que la cloison (12) est en un matériau souple du type tissu.

25 30 35 40 45 50 55 60 65 moyen de traitement d'air de séchage de façon à fonctionner indépendamment et pouvoir obtenir des conditions de séchage individuel dans chaque chambre, indépendamment des autres chambres, caractérisé en ce que chaque chambre est fermée et séparée d'une chambre contiguë par une cloison légère (12) et en ce que les conditions de séchage sont ajustées de façon telle que lorsque les charges de bois sont transférées depuis une première chambre (K,, K3) jusqu'à la chambre suivante (K2, K4), le processus de séchage dans cette chambre suivante (K2, K4) s'effectue sensiblement à partir du stade du pro-gramme de séchage qui avait été atteint dans la chambre précédente (K, , K3).

2. Four de séchage à chambres transitoires selon la revendication 1, caractérisé en ce que les chambres de séchage (KI, K3 et K2, K4) sont au

* * * * *